

DESIGN DATA TABLES 2

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MILLIMETRE-INCH CONVERSION

The table lists inch equivalents of millimetre values from 0.5mm. to 100mm. Inches are given to four significant figures.

PHASE SHIFT OSCILLATOR C-R VALUES

The table lists C and R values at frequencies from 100Hz to 10kHz for phase shift oscillators having the basic circuit configuration shown. The R values are calculated to two significant figures.

$2\pi f$ VALUES

It is frequently necessary to carry out calculations involving the expression $2\pi f$. When approximate solutions only are required, calculations can become tedious after the unwieldy figure for π has been introduced. The table provides an answer to this problem by listing round figure values for $2\pi f$, whereupon subsequent calculations are eased. The table is used by finding the frequency nearest that under consideration. Thus, the approximate value of $2\pi f$ when f equals 100Hz is 650. Multiply the $2\pi f$ figure by 1,000 for kHz and by 1,000,000 for MHz.

AUDIO OUTPUT POWERS

The table lists r.m.s. output powers in speakers of 3Ω to 75Ω for transformerless transistor Class B output stages. $V(\text{peak})$ is the maximum output voltage swing negative or positive, whichever is the lower. As an example, an output stage offering a $V(\text{peak})$ of 6 volts into an 8Ω speaker can produce an r.m.s. output power of 2.2 watts.

e Tables

PARALLEL-R SERIES-C VALUES

The table gives the total resistance of two resistors in parallel, or the total capacitance of two capacitors in series, for preferred values in the E6 range from 1 to 100. Use appropriate multipliers: thus, $3.3\text{M}\Omega$ in parallel with $15\text{M}\Omega$ gives $2.7\text{M}\Omega$, or 47pF in series with 22pF gives 15pF . Results are calculated to two significant figures.

E-R DISSIPATION

The table gives dissipation in watts for resistance at commonly encountered voltages. As an example, a voltage of 4 volts across a 10Ω resistor causes a dissipation in that resistor of 1.6 watts.

INCH-MILLIMETRE CONVERSION

The table lists millimetre equivalents of inch values from 0.005in. to 10in. Millimetres are given to four significant figures.

These Design Data Tables are the second in a series of Wallcharts given away with copies of
RADIO & ELECTRONICS CONSTRUCTOR

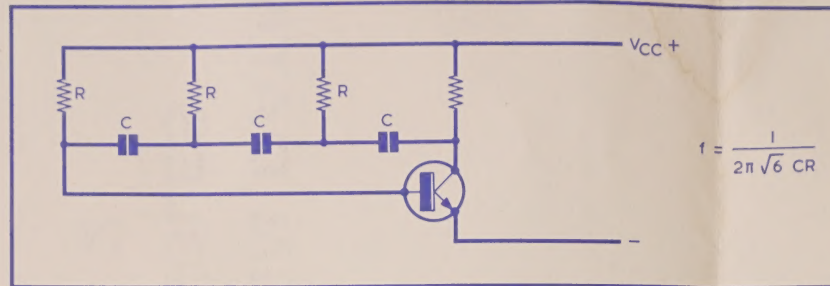
DESIGN DATA TABLES

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MILLIMETRE—INCH CONVERSION

mm.	inch	mm.	inch	mm.	inch
0.5	0.01969	21	0.8268	61	2.402
1.0	0.03937	22	0.8661	62	2.441
1.5	0.05906	23	0.9055	63	2.480
2.0	0.07874	24	0.9449	64	2.520
2.5	0.09843	25	0.9843	65	2.559
3.0	0.1181	26	1.024	66	2.598
3.5	0.1378	27	1.063	67	2.638
4.0	0.1575	28	1.102	68	2.677
4.5	0.1772	29	1.142	69	2.717
5.0	0.1969	30	1.181	70	2.756
5.5	0.2165	31	1.220	71	2.795
6.0	0.2362	32	1.260	72	2.835
6.5	0.2559	33	1.299	73	2.874
7.0	0.2756	34	1.339	74	2.913
7.5	0.2953	35	1.378	75	2.953
8.0	0.3150	36	1.417	76	2.992
8.5	0.3347	37	1.457	77	3.031
9.0	0.3543	38	1.496	78	3.071
9.5	0.3740	39	1.535	79	3.110
10.0	0.3937	40	1.575	80	3.150
10.5	0.4134	41	1.614	81	3.189
11.0	0.4331	42	1.654	82	3.228
11.5	0.4528	43	1.693	83	3.268
12.0	0.4724	44	1.732	84	3.307
12.5	0.4921	45	1.772	85	3.346
13.0	0.5118	46	1.811	86	3.386
13.5	0.5315	47	1.850	87	3.425
14.0	0.5512	48	1.890	88	3.465
14.5	0.5709	49	1.929	89	3.504
15.0	0.5906	50	1.969	90	3.543
15.5	0.6102	51	2.008	91	3.583
16.0	0.6299	52	2.047	92	3.622
16.5	0.6496	53	2.087	93	3.661
17.0	0.6693	54	2.126	94	3.701
17.5	0.6890	55	2.165	95	3.740
18.0	0.7087	56	2.205	96	3.780
18.5	0.7284	57	2.244	97	3.819
19.0	0.7480	58	2.283	98	3.859
19.5	0.7677	59	2.323	99	3.898
20.0	0.7874	60	2.362	100	3.937

PHASE SHIFT OSCILLATOR C—R VALUES

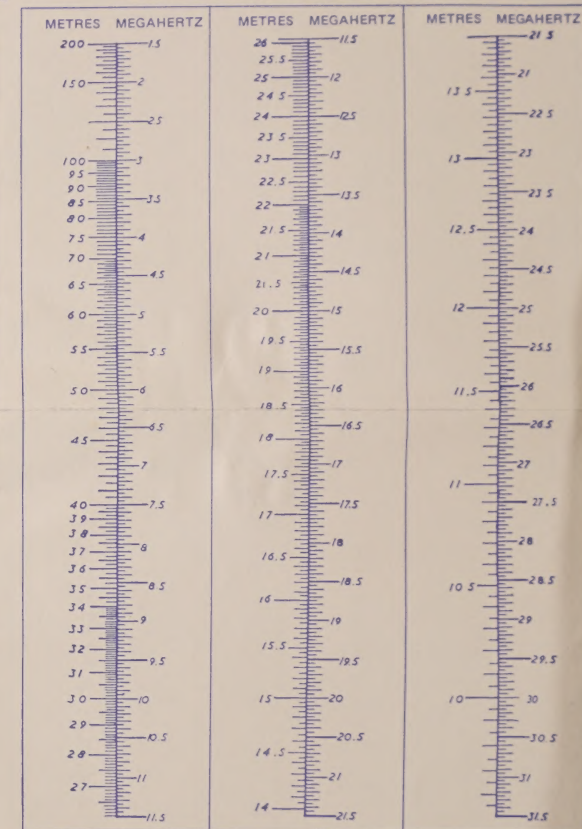


Frequency	200pF	1,000pF	5,000pF	0.01μF	0.05μF
100Hz	3.3MΩ	650kΩ	130kΩ	65kΩ	13kΩ
200Hz	1.6MΩ	330kΩ	65kΩ	33kΩ	6.5kΩ
400Hz	810kΩ	160kΩ	33kΩ	16kΩ	3.3kΩ
500Hz	650kΩ	130kΩ	26kΩ	13kΩ	2.6kΩ
750Hz	430kΩ	87kΩ	17kΩ	8.7kΩ	1.7kΩ
1kHz	330kΩ	65kΩ	13kΩ	6.5kΩ	1.3kΩ
3kHz	110kΩ	22kΩ	4.3kΩ	2.2kΩ	
5kHz	65kΩ	13kΩ	2.6kΩ	1.3kΩ	
7.5kHz	43kΩ	8.7kΩ	1.7kΩ		
10kHz	33kΩ	6.5kΩ	1.3kΩ		

2πf VALUES

2πf	Hz	2πf	Hz	2πf	Hz	2πf	Hz
6.5	1.03	45	7.16	250	39.8	950	151
7	1.11	50	7.96	300	47.7	1,000	159
7.5	1.19	55	8.75	350	55.7	1,500	239
8	1.27	60	9.55	400	63.7	2,000	318
8.5	1.35	65	10.3	450	71.6	2,500	398
9	1.43	70	11.1	500	79.6	3,000	477
9.5	1.51	75	11.9	550	87.5	3,500	557
10	1.59	80	12.7	600	95.5	4,000	637
15	2.39	85	13.5	650	103	4,500	716
20	3.18	90	14.3	700	111	5,000	796
25	3.98	95	15.1	750	119	5,500	875
30	4.77	100	15.9	800	127	6,000	955
35	5.57	150	23.9	850	135		
40	6.37	200	31.8	900	143		

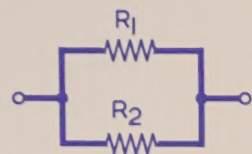
WAVELENGTH-FREQUENCY CONVERSION CHART



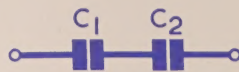
AUDIO OUTPUT POWERS

V(peak)	V(r.m.s.)	3Ω	8Ω	15Ω	35Ω	75Ω
3	2.12	1.5	0.56	0.30	0.13	0.060
4	2.83	2.7	1.0	0.53	0.23	0.11
5	3.54	4.2	1.6	0.84	0.36	0.17
6	4.24	6.0	2.2	1.2	0.51	0.24
7.5	5.30	9.4	3.5	1.9	0.80	0.37
9	6.36	13	5.1	2.7	1.2	0.54
12	8.48	24	9.0	4.8	2.1	0.96
15	10.6	37	14	7.5	3.2	1.5

PARALLEL-R SERIES- C VALUES



$$\frac{1}{R_{\text{total}}} = \frac{1}{R_1} + \frac{1}{R_2}$$



$$\frac{1}{C_{\text{total}}} = \frac{1}{C_1} + \frac{1}{C_2}$$

	1	1.5	2.2	3.3	4.7	6.8	10	15	22	33	47	68	100
1	0.50	0.60	0.69	0.77	0.82	0.87	0.91	0.94	0.96	0.97	0.98	0.99	0.99
1.5	0.60	0.75	0.89	1.0	1.1	1.2	1.3	1.4	1.4	1.4	1.5	1.5	1.5
2.2	0.69	0.89	1.1	1.3	1.5	1.7	1.8	1.9	2.0	2.1	2.1	2.1	2.2
3.3	0.77	1.0	1.3	1.7	1.9	2.2	2.5	2.7	2.9	3.0	3.1	3.1	3.2
4.7	0.82	1.1	1.5	1.9	2.4	2.8	3.2	3.6	3.9	4.1	4.3	4.4	4.5
6.8	0.87	1.2	1.7	2.2	2.8	3.4	4.0	4.7	5.2	5.6	5.9	6.2	6.4
10	0.91	1.3	1.8	2.5	3.2	4.0	5.0	6.0	6.9	7.7	8.2	8.7	9.1
15	0.94	1.4	1.9	2.7	3.6	4.7	6.0	7.5	8.9	10	11	12	13
22	0.96	1.4	2.0	2.9	3.9	5.2	6.9	8.9	11	13	15	17	18
33	0.97	1.4	2.1	3.0	4.1	5.6	7.7	10	13	17	19	22	25
47	0.98	1.5	2.1	3.1	4.3	5.9	8.2	11	15	19	24	28	32
68	0.99	1.5	2.1	3.1	4.4	6.2	8.7	12	17	22	28	34	40
100	0.99	1.5	2.2	3.2	4.5	6.4	9.1	13	18	25	32	40	50

E-R DISSIPATION

Resistance	1V	2V	3V	4V	6V	8V	10V	15V	20V	30V	40V
1Ω	1	4	9	16							
2.2Ω	0.45	1.8	4.1	7.3	16						
4.7Ω	0.21	0.85	1.9	3.4	7.7	14	21				
6.8Ω	0.15	0.59	1.3	2.4	5.3	9.4	15				
10Ω	0.1	0.4	0.9	1.6	3.6	6.4	10				
22Ω	0.045	0.18	0.41	0.73	1.6	2.9	4.5	10	18		
47Ω	0.021	0.085	0.19	0.34	0.77	1.4	2.1	4.8	8.5	19	
68Ω	0.015	0.059	0.13	0.24	0.53	0.94	1.5	3.3	5.9	13	
100Ω	0.01	0.04	0.09	0.16	0.36	0.64	1.0	2.3	4.0	9.0	16
220Ω		0.018	0.041	0.073	0.16	0.29	0.45	1.0	1.8	4.1	7.3
470Ω			0.019	0.034	0.077	0.14	0.21	0.48	0.85	1.9	3.4
680Ω			0.013	0.024	0.053	0.094	0.15	0.33	0.59	1.3	2.4
1kΩ				0.016	0.036	0.064	0.1	0.23	0.4	0.9	1.6
2.2kΩ					0.016	0.029	0.045	0.1	0.18	0.41	0.73
4.7kΩ						0.014	0.021	0.048	0.085	0.19	0.34

INCH—MILLIMETRE CONVERSION

inch	mm.	inch	mm.	inch	mm.
0.005	0.1270	0.31	7.874	0.71	18.03
0.01	0.2540	0.32	8.128	0.72	18.29
0.015	0.3810	0.33	8.382	0.73	18.54
0.02	0.5080	0.34	8.636	0.74	18.80
0.025	0.6350	0.35	8.890	0.75	19.05
0.03	0.7620	0.36	9.144	0.76	19.30
0.035	0.8890	0.37	9.398	0.77	19.56
0.04	1.016	0.38	9.652	0.78	19.81
0.045	1.143	0.39	9.906	0.79	20.07
0.05	1.270	0.40	10.16	0.80	20.32
0.055	1.397	0.41	10.41	0.81	20.57
0.06	1.524	0.42	10.67	0.82	20.83
0.065	1.651	0.43	10.92	0.83	21.08
0.07	1.778	0.44	11.18	0.84	21.34
0.075	1.905	0.45	11.43	0.85	21.59
0.08	2.032	0.46	11.68	0.86	21.84
0.085	2.159	0.47	11.94	0.87	22.10
0.09	2.286	0.48	12.19	0.88	22.35
0.095	2.413	0.49	12.45	0.89	22.61
0.1	2.540	0.50	12.70	0.90	22.86
0.11	2.794	0.51	12.95	0.91	23.11
0.12	3.048	0.52	13.21	0.92	23.37
0.13	3.302	0.53	13.46	0.93	23.62
0.14	3.556	0.54	13.72	0.94	23.88
0.15	3.810	0.55	13.97	0.95	24.13
0.16	4.064	0.56	14.22	0.96	24.38
0.17	4.318	0.57	14.48	0.97	24.64
0.18	4.572	0.58	14.73	0.98	24.89
0.19	4.826	0.59	14.99	0.99	25.15
0.20	5.080	0.60	15.24	1	25.40
0.21	5.334	0.61	15.49	2	50.80
0.22	5.588	0.62	15.75	3	76.20
0.23	5.842	0.63	16.00	4	101.6
0.24	6.096	0.64	16.26	5	127.0
0.25	6.350	0.65	16.51	6	152.4
0.26	6.604	0.66	16.76	7	177.8
0.27	6.858	0.67	17.02	8	203.2
0.28	7.112	0.68	17.27	9	228.6
0.29	7.366	0.69	17.53	10	254.0
0.30	7.620	0.70	17.78		

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